

A new genus and species of "*Cochlespira*-like" turrids

(Gastropoda, Toxoglossa, Turridae)

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ABSTRACT. The new genus and species *Toxicochlespira pagoda* sp.n. from the Ceram Sea (Western Pacific) is described. Although the shell of the new species has great similarity to the genus *Cochlespira* Conrad, 1865 (subfamily Turriculinae), the radula with hollow marginal teeth indicates that the genus belongs to a different subfamily, probably the Mangeliinae. The new species also has a resemblance to *Thatcheriasyrinx* Powell, 1969; the latter genus also probably belongs to the same group.

RESUME. Un nouveau genre et une nouvelle espèce, *Toxicochlespira pagoda* sp.n. sont décrits de la Mer de Ceram (région occidentale de l'Océan Pacifique). Malgré la ressemblance de la coquille de la nouvelle espèce à celles du genre *Cochlespira* Conrad, 1865 (sous-famille des Turriculinae), la radula avec des dents marginales creuses indique l'appartenance du nouveau genre à une autre sous-famille, probablement les Mangeliinae. Le nouvelle espèce ressemble également à *Thatcheriasyrinx* Powell, 1969; ce dernier genre appartenant sans doute au même groupe.

KEYWORDS: Gastropoda, Turridae, *Toxicochlespira pagoda* gen. et sp. nov.

INTRODUCTION.

The "Cochlespirinid group of genera" (POWELL, 1966, 1969) represents a well-defined group of Turridae characterized, by a more or less pagodiform shell, by the absence (or almost complete absence) of axial sculpture, and by the presence of a strikingly pronounced spiral keel at the whorl periphery, which is usually ornamented with spiny nodules. The taxonomic composition of the group varies with the opinions of different authors, but the genus *Cochlespira* Conrad, 1865 is recognized as central and most typical. Unfortunately, the type species of *Cochlespira*, *C. cristata* (Conrad, 1847) is a fossil, and thus anatomical features of the genus can only be based on recent species. The latter are, however, conchologically very similar to each other and to the

type species. The radula consists of solid "wishbone" marginal teeth and with a large central tooth; an operculum is present. These features, along with the characteristic deep, U-shaped, anal sinus allow confidently to assign *Cochlespira* in the subfamily Turriculinae.

Two specimens of a new species at our disposal are conchologically extremely similar to species of *Cochlespira*. However, anatomical study shows that the species should be referred to a genus other than *Cochlespira* and to a subfamily other than Turriculinae.

Descriptions of the new taxa are given below. Type specimens are deposited in the Zoological Museum of Moscow State University.

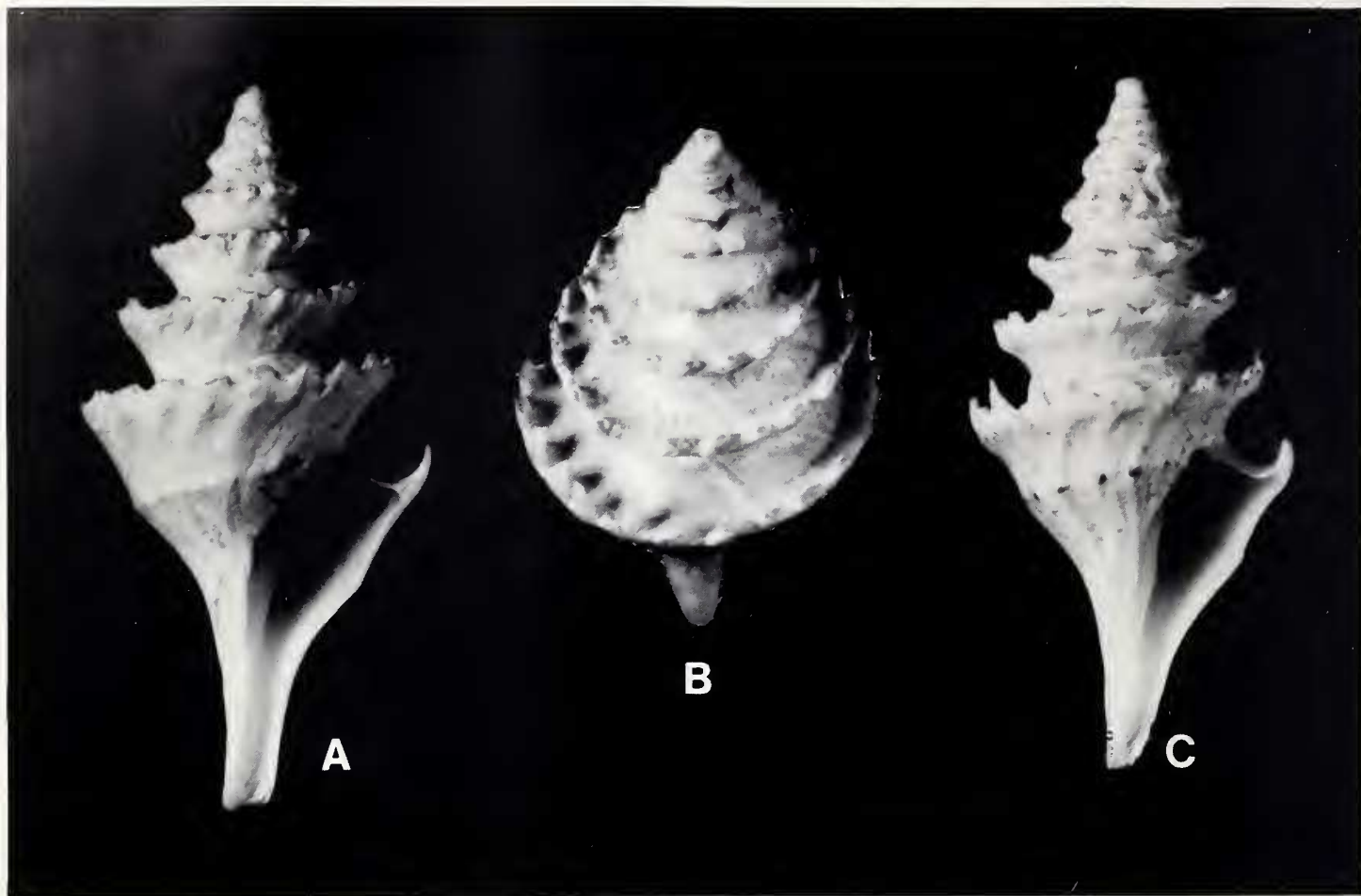


Fig. 1. *Toxicochlespira pagoda* new species. A,B -holotype (the shell height 14.7 mm); C - paratype (the shell height 13.2 mm).

RESULTS.

Toxicochlespira new genus

Type species - *Toxicochlespira pagoda* new species.

Diagnosis. Shell medium size (about 15 mm), pagodiform, with high spire, white. Whorls are distinctly angulated, with a strong keel at the periphery. The keel is ornamented with triangular, flattened, upwardly curved spiny nodules. Axial sculpture consists of obscure folds which continue the spiny nodules of the spiral keel. The spiral sculpture other than the peripheral keel, consists of a prominent rib on the shell base. This rib is nodulose at intersections with the axial folds. The siphonal canal is long and

straight. The anal sinus is weakly developed, and very shallow; its apex is situated at the lower half of the shoulder slope. The operculum is absent. The radula consists of two rows of hollow "toxoglossate" marginal teeth.

The new genus is very similar to the genus *Cochlespira* Conrad, 1865, from which it can be distinguished by the absence of spiral riblets on the shell surface, by the weakly pronounced anal sinus, by the absence of an operculum and by the "toxoglossate" radula. The new genus also has considerable similarity to the genus *Thatcheriasyrinx* Powell, 1969,

but that genus (at present of uncertain taxonomic position) is characterized by a deep anal sinus typical of Daphnellinae, and by the complete absence of sculpture (except the peripheral keel).

Toxicochlespira pagoda new species

(Fig. 1, 2)

Material. R/V "Vitjaz", 57th cruise, station 7273, 2 29'S, 130 39' E (NE of Ceram Island, Ceram Sea, Western Pacific), 23.03.1975, depth 612-630 m, Sigsbee trawl, 2 specimens (holotype, N Lc 14354, and paratype, N Lc 14355).

Description of holotype. The shell is pagodiform, slender, with a high spire, and consists of 7.5 preserved whorls. The shell colour is white, with the surface nacreously iridescent, especially between the upper suture and peripheral keels. The whorls are sharply angled at the periphery, forming an acute angle. The whorl surface is slightly concave above and below the periphery, with the concavity most pronounced just above the periphery. Sutures are clear and shallow.

The body whorl is large, and comprises about 60% of the shell height; the angled shell base gradually passes into the siphonal canal.

Growth lines are very thin, and better seen on the upper half of the whorl. At the periphery, the whorls are ornamented with a strong keel which becomes more pronounced with shell growth. The keel is covered with flat, acute triangular spiny nodules (judging from well-preserved ones) which are more or less upwardly curved. Many of these spiny nodules are broken off. They number about 25 on each of two last whorls. On the shell base, there is a strong, but low and rounded, rib marked with nodules, most of which corresponding to the peripheral keel spiny nodules. There is no other spiral sculpture.

Axial sculpture consists of obscure, oblique, broad and low folds corresponding to the spiny nodules of the peripheral keel. These folds are absent above the whorl periphery and weaken rapidly in the space between the periphery and the lower suture.

The aperture is small and more or less rectangular. Its parietal and palatal sides connect at a right angle. The outer lip is grooved where the peripheral keel intersects. The siphonal canal is long and straight, and weakly differentiated from the aperture. The anal sinus, judging from the growth lines, is very

shallow, indistinctly s-shaped; its deepest point placed closer to the periphery than to the suture.

Shell height 14.7 mm, body whorl height 9.0 mm, aperture height 7.2 mm, shell diameter 7.5 mm.

The paratype. The shell height is 13.2 mm; the shell is very similar to the holotype, with the nodules on the rib of the shell base more pronounced. The operculum is absent. The body lacks pigmentation. The head is small with a very short neck, and with short tentacles rounded at the tips. There are no eyes. The rhynchostome is narrow, probably with a large and powerful sphincter. The proboscis is long (Fig. 2 A,B), and bent a few times inside the rhynchocoel. The right salivary gland is nearly twice as large as the left. The venom gland is rather short with a length of about 2 mm. The muscular bulb is small, situated to the right side of the oesophagus. The odontophore is absent and the radula sac opens in the buccal cavity dorsally at the left side. The entrance of the venom gland into the oesophagus is covered by the circum-oral nerve ring. The radular teeth are hollow (Fig. 2 C), dagger-like with a large (about 1/3 of the tooth length), conic, basal part and short straight blade. The tooth length is about 0.12 mm.

DISCUSSION.

The new genus cannot be attributed with confidence to any present subfamily of Turridae. Judging from the radular tooth morphology, the absence of the operculum, and the anal sinus it can be provisionally placed into the subfamily Mangeliinae. However, the conchological similarity of *Toxicochlespira* gen. nov. to the "Cochlespirinid group" (Turriculinae) may indicate relationship and the phylogenetically independent appearance of toxoglossan dentition. In such a case, and bearing in mind the necessity of the recognition of strictly monophyletic taxa, it would be necessary to consider this genus as a separate taxon of subfamilial rank. It can also be suggested that the genus *Thatcheriasyrinx* Powell, 1969, belongs to the same group as *Toxicochlespira* gen. nov., since although its radular morphology is unknown, the character of the anal sinus ("dapnelline" but not "turriculine" - POWELL, 1969) may suggest the presence of toxoglossan dentition.

Toxicochlespira is another turrid example of gastropods with very similar shell but with very different anatomy and radular morphology. Such a shell similarity can either be considered as a homeomorphy, (*i.e.* convergence) or as evidence of relationship of the taxa. If the latter view is adopted, it is necessary to decide the taxonomical status of such related groups.

In general, the question of taxonomic significance of radular tooth structure ("toxoglossan" or "non toxoglossan" tooth) or, the radular type (including the examples of its absence) is unresolved. POWELL (1966) believed that as the "toxoglossan" teeth appeared repeatedly in different phylogenetic lineages of *Toxoglossa*, it is possible to unite the forms with different radular types within not only a single subfamily, but even within a single genus. Generally recognizing the possibility of repeated appearance of "toxoglossan" teeth, subsequent authors, however, tried to divide "toxoglossan" and "non toxoglossan" species at least at generic level. McLEAN (1971) included within his subfamilies only forms with "toxoglossan" or "non toxoglossan" radulae (except for the Clavinae, which are separated on the basis of their plesiomorphic considered five -rowed radula).

Nevertheless, the principle of division of taxa with different types of radulae at the suprageneric level has not been consistently applied. For example, *Imaclava unimaculata* possesses a "toxoglossan" radula (McLEAN, 1971, Fig. 13; SHIMEK & KOHN, 1981, Fig. 7) but was assigned to Clavinae (McLEAN, 1971); the "toxoglossan" genus *Toxiclionella* and subgenus *Caliendrula* attributed by R.N. KILBURN (1985) to the "non toxoglossan" Clavatulinae (the latter taxon thus became paraphyletic); "non toxoglossan" species of Terebridae were included in

"toxoglossan" genus *Terebra* (BRATCHER, CERNOHORSKY, 1987). In all these cases the structure of marginal teeth was considered to be a less valuable feature than the number of the teeth in each transverse radular row, or conchological similarity.

The same situation occurs with the Turridae without radula. All the known species (except the genus *Taranis*) are referred on the basis of conchological features only to subfamilies, the species of which usually have radula, (KANTOR & SYSOEV, 1986; 1989).

Both the appearance of hollow marginal teeth and the loss of the radula, cause considerable changes in feeding mechanism (and most probably in diet) (KANTOR & SYSOEV, 1990). Thus, such highly apomorphic features may be considered as functionally significant and therefore evolutionarily important enough for the isolation of taxa of suprageneric level. Moreover, in cases of conchologically similar genera differing principally in radular morphology, the radular features should be considered as more important for the definition of the genus and its subfamilial position.

The genus *Toxicochlespira* illustrates a major problem in turrid systematics, of how to classify gastropods which have similar shell features but very different radulae. The most difficult problem is the recognition of monophyletic taxa. At present the emphasis has been put upon conchological similarity, but more anatomical studies are needed to test these decisions.

It should be noted, that in such a complex and diverse group as *Toxoglossa*, the use of only one suprageneric unit -the subfamily - is insufficient. Perhaps, the use of intermediate units (for example, tribes) would allow a convenient and natural classification.

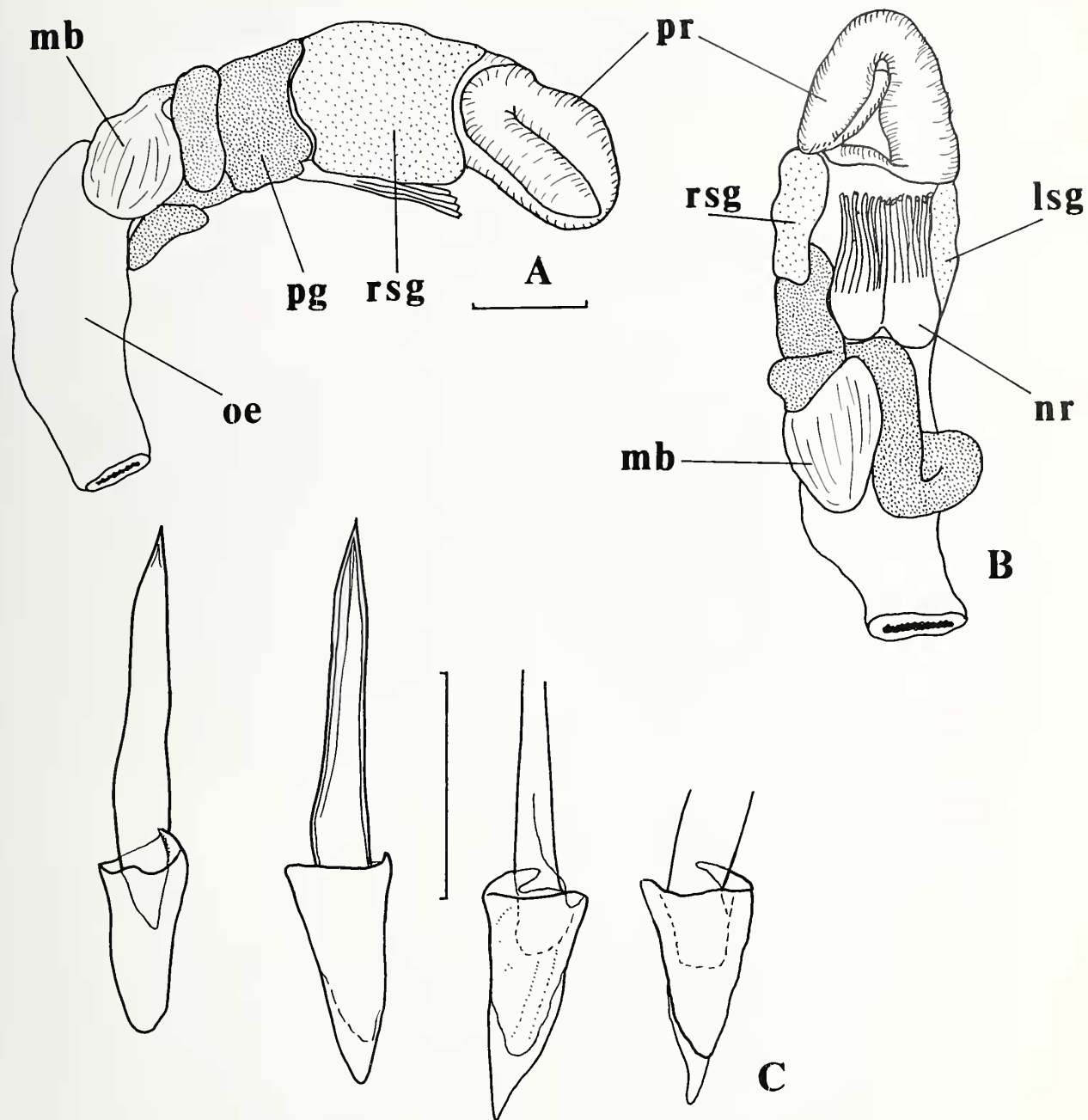


Fig. 2. *Toxicochlespira pagoda* new species, details of the anatomy of the paratype. A,B - organs of the body haemocoel (scale 0.5 mm); C - marginal teeth in different projections (scale 0.05 mm).

Abbreviations: lsg - left salivary gland; mb - muscular bulb of the poison gland; nr - nervous ring; oe - oesophagus; pg - poison gland; pr - proboscis; rsg - right salivary gland.

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